# A vision for Water Resources Research

Clark, Martyn P ; Bahr, Jean A ; Bierkens, Marc F P ; Cai, Ximing ; Hogue, Terri S ; Luce, Charles H ; Lundquist, Jessica D ; Mackay, D Scott ; van Meerveld, H J Ilja ; Rajaram, Harihar ; Sanchez-Vila, Xavier ; Troch, Peter A

Abstract: Water Resources Research (WRR) continues to evolve as the team of international editors beginsa new 4 year term of service. In this Editorial we summarize the importance of WRR in the hydrologicsciences, the challenges ahead, and the plans for the future of the journal.

DOI: https://doi.org/10.1002/2017WR021050

AGU PUBLICATIONS

Water Resources Research

EDITORIAL

10.1002/2017WR021050

**Key Points:**
- Our primary goal as WRR Editors is to enhance the quality and impact of hydrologic science
- We will strive to ensure that WRR is regarded as the "journal of choice" for high-quality interdisciplinary science
- The WRR Editorial board is committed to increasing the impact and visibility of WRR papers

**Correspondence to:**
M. P. Clark,
mclark@ucar.edu

**Citation:**
Clark, M. P., et al. (2017), A vision for *Water Resources Research*, *Water Resour. Res.*, *53*, 4530–4532, doi:10.1002/2017WR021050.

Received 3 MAY 2017
Accepted 4 MAY 2017
Accepted article online 12 MAY 2017
Published online 3 JUN 2017



# A vision for *Water Resources Research*

**Martyn P. Clark[1], Jean A. Bahr[2], Marc F. P. Bierkens[3], Ximing Cai[4], Terri S. Hogue[5], Charles H. Luce[6], Jessica D. Lundquist[7], D. Scott Mackay[8], H. J. (Ilja) van Meerveld[9], Harihar Rajaram[10], Xavier Sanchez-Vila[11], and Peter A. Troch[12]**

[1]Hydrometeorological Applications Program Research Applications Laboratory, National Center for Atmospheric Research, Boulder, Colorado, USA, [2]Department of Geoscience, University of Wisconsin-Madison, Madison, Wisconsin, USA, [3]Department of Physical Geography, Utrecht University, Utrecht, Netherlands, [4]Department of Civil Engineering, University of Illinois at Urbana-Champaign, Urbana, Illinois, USA, [5]Department of Civil and Environmental Engineering, Colorado School of Mines, Golden, Colorado, USA, [6]U.S. Forest Service Rocky Mountain Research Station, Boise, Idaho, USA, [7]Department of Civil and Environmental Engineering, University of Washington, Seattle, Washington, USA, [8]Department of Geography, University at Buffalo (SUNY), Buffalo, New York, USA, [9]Department of Geography, University of Zurich, Zurich, Switzerland, [10]Department of Civil, Environmental and Architectural Engineering, University of Colorado-Boulder, Boulder, Colorado, USA, [11]Universitat Politecnica de Catalunya, Barcelona, Spain, [12]Department of Hydrology and Atmospheric Sciences, University of Arizona, Tucson, Arizona, USA

**Abstract** *Water Resources Research* (WRR) continues to evolve as the team of international editors begins a new 4 year term of service. In this Editorial we summarize the importance of WRR in the hydrologic sciences, the challenges ahead, and the plans for the future of the journal.

*Water Resources Research* (WRR) plays a leading role in advancing hydrologic science. As AGU's hydrology journal, WRR has nurtured and published major breakthroughs in hydrologic process understanding and prediction capabilities, accomplished through innovative measurement campaigns, novel data analysis techniques, and elegant computational methods. These science advances have, in turn, improved our understanding of the effects of global change on water resources and enabled solutions to increasingly difficult problems, such as obtaining and managing reliable and safe water supplies and improving environmental conditions in lakes and rivers. Developing synergies between process-oriented and applications-oriented science is becoming more important as large changes in coupled human-natural systems impose new stresses on hydrologic systems and create new needs for hydrologic process understanding and prediction. At the threshold of our 4 year term as WRR Editors, we reflect on the strong societal need for hydrologic science and we consider how we (as Editors) can increase the value of hydrologic science.

Our primary goal as WRR Editors is to enhance the quality and impact of hydrologic science. We will continue in the footsteps of our predecessors to maintain the very high standards of the WRR review process [see *Parlange et al.*, 2005; *Kumar et al.*, 2009; *Montanari et al.*, 2013 for details]. The critical function of peer-review is to help authors improve the caliber and accessibility of their published papers. A fair, constructive, and timely review process emphasizing rigorous logic strengthens research outputs and accelerates advances in science. The Editorial board will continue the strong WRR tradition where reviewers go out of their way to provide constructive advice to authors, and where Editors and Associate Editors provide meaningful guidance to authors on ways to improve their papers.

The WRR Editorial board is committed to increasing the impact and visibility of WRR papers throughout the broader scientific community and society. WRR will publish more Editorials and Commentaries that highlight the major breakthroughs in hydrologic science. WRR will also facilitate broader communication of hydrologic science advances, through opportunities for authors to publish plain language summaries of their work in Eos, publishing commentaries that showcase the relevance of hydrologic science for society, through posts on the Editor's Vox, by identifying a larger fraction of papers for press attention, and expanding WRR's presence within social media.

A key challenge for the hydrologic sciences, and for WRR, is to unify currently fragmented research efforts. Today's environmental problems cut across many different aspects of Earth system and social science, including physical, chemical, and ecological processes, and human systems, requiring large teams of

scientists sharing data and model source codes to advance process understanding and improve predictive capabilities. WRR will foster and nurture this interdisciplinary growth through commentaries and special sections, and use the WRR debates series to integrate the diversity of hydrologic science.

WRR will continue to embrace all aspects of hydrologic science, including observational, experimental, theoretical, analytical, numerical, and data-driven approaches that advance the science of water and its management. As such, WRR welcomes cutting-edge papers in hydrometeorology, land-atmosphere interactions, snow hydrology, ecohydrology, vadose zone hydrology, groundwater hydrology, hillslope and catchment hydrology, limnology, urban hydrology, water quality, biogeochemical processes, hydrogeophysics, contaminant transport, geomorphology, erosion and sediment dynamics, extreme events, climate and land use change impacts on hydrology and health, stochastic theory, uncertainty assessment, streamflow prediction, water resource economics and management, coupled human-hydrology systems (including socio-hydrology), and the role of hydrologic processes in Earth system change. WRR seeks to publish papers describing new tools and new data, new measurement and data analysis techniques, comprehensive measurement campaigns, innovative use of remotely sensed observations, and advances in parameter estimation methodologies, data assimilation, and model-data fusion. More generally, WRR is interested in studies across different spatial scales, from the pore scale to the planet.

WRR will continue to give recognition and attention to both traditional challenges and emerging research themes. Examples of traditional challenges include parameterizing distributed models using spatial patterns of landscape properties, understanding how spatial heterogeneity and connectivity defines the scaling of flow and transport from pores to hillslopes to catchments, and understanding the eco-hydro-geomorphological response to climate and land use change. Some examples of emerging topics include recent advances in socio-hydrology, catchment to pore biogeochemistry, results from large scale field experiments and new remote-sensing missions, and multivariate and multiscale data syntheses that explain the dominant controls on catchment coevolution.

WRR represents the geographic and topical diversity of the hydrologic science community. The AGU membership is global, and hence WRR is interested in advances in hydrologic science that are underway across all regions of the globe. Our expanded international team of Editors have been involved in field studies across every continent (except Antarctica), and we are all motivated to understand how diverse research perspectives can contribute to the grand challenges of hydrologic science. Our need to understand threats to global water security and the role of hydrologic processes in Earth system change means that we must integrate process understanding and modeling capabilities across different environments. Similarly, the Darwinian approach to hydrology—i.e., developing new process explanations through large-sample comparisons of catchment behavior—requires data, information, knowledge, and (indeed) wisdom from hydrologists worldwide. WRR will be looking to promote new international collaborations and syntheses that advance process understanding and modeling capabilities.

The incoming team is tremendously grateful to members of the previous Editorial board, especially Alberto Montanari, Günter Blöschl, Anna Michalak, and Graham Sander. The vision of the previous team had an incredible influence on the advancement of our discipline. Two contributions are especially noteworthy: the effort to develop the WRR 50 year special issue to highlight major research advances and the outstanding research challenges for the hydrologic sciences [*Montanari et al*., 2015; *Rajaram et al*., 2015], and the new "WRR debates" series to unify competing perspectives on hydrologic science. As a group, the previous Editorial board advanced a compelling vision for the journal, and managed an effective and efficient review process, which has propelled WRR to new heights.

As we move forward in these next 4 years, we appreciate the very strong connection between WRR and the community of authors and reviewers. The success of WRR really depends on the extent to which hydrologists from around the world feel that they are well served by WRR. In our 4 year term we will strive to ensure that WRR is regarded as the "journal of choice" for high-quality science by hydrologists and other researchers in the water resources area, that WRR is the backbone of the hydrologic research community, and that WRR maintains its tradition of high scientific standards. As Editors we're most interested in helping authors increase the quality and impact of their papers, hence increasing the value of hydrologic science investments. Please feel free to share your ideas, your opinions, your concerns, and your experiences, so that we can improve the extent that WRR advances hydrologic science.

## References

Kumar, P., T. Illangasekare, G. Sander, J. Selker, and T. Torgersen (2009), Editorial: Building on the legacy of *Water Resources Research*, *Water Resour. Res.*, *45*, W06101, doi:10.1029/2009WR008174.

Montanari, A., G. Blöschl, X. Cai, D. S. Mackay, A. M. Michalak, H. Rajaram, and G. Sander (2013), Editorial: Toward 50 years of water resources research, *Water Resour. Res.*, *49*, 7841–7842, doi:10.1002/2013WR014986.

Montanari, A., J. Bahr, G. Blöschl, X. Cai, D. S. Mackay, A. M. Michalak, H. Rajaram, and G. Sander (2015), Fifty years of *Water Resources Research*: Legacy and perspectives for the science of hydrology, *Water Resour. Res.*, *51*, 6797–6803, doi:10.1002/2015WR017998.

Parlange, M. B., B. Berkowitz, A. Porporato, T. Torgersen, and S. W. Tyler (2005), Editorial: Future of *Water Resources Research*, *Water Resour. Res.*, *41*, W01001, doi:10.1029/2004WR003899.

Rajaram, H., J. M. Bahr, G. Blöschl, X. Cai, D. Scott Mackay, A. M. Michalak, A. Montanari, X. Sanchez-Villa, and G. Sander (2015), A reflection on the first 50 years of *Water Resources Research*, *Water Resour. Res.*, *51*, 7829–7837, doi:10.1002/2015WR018089.